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LABORATORY PRECAUTIONS: No. 4.

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Corrosive—Arsenic Trichloride.—An accident which ended fatally occurred in connection with a compound in which arsenic trichloride was used. A man, wearing a respirator, picked up a stone jar containing arsenic trichloride to pour the contents into a container. The jar broke and the liquid splashed all over his clothes. He ran into the bathroom, got into the bath and turned on both taps, while someone else peeled off his clothes. He was still wearing his respirator when he got into the bath. The workers were supplied with protective clothing, consisting of waterproof suits, but the unfortunate man was not wearing his suit at the time of the accident.

The man was admitted to hospital suffering from severe corrosive burns of the legs, but he was not then suffering from any respiratory distress. Later he developed laryngitis and eventually bronchial pneumonia. The burns were not very extensive and were getting better. The respiratory distress began about six days after admission to hospital, and a medical witness expressed the opinion that he must have inhaled the vapour through his mouth. This doctor did not believe he had absorbed any arsenic indirectly from the burns, but the post mortem examination showed such a large amount of arsenic in the liver after five days that there must have been slow absorption from the skin.—*Chemical Trade J.*, 1939, 105 (2724), 107; *A.B.C.M. Quarterly Safety Summary*, 1939, Vol. 10, No. 39.

Note.—Flury & Zernik (Schädliche Gase, p. 179) mention that arsenic trichloride acts more strongly on the lungs than on the prior respiratory tract and that the effect of adsorbed arsenic had to be taken into account. This is presumably from skin burns, as it is stated later that resorptive poisoning from inhaled arsenic trichloride (vapour—*Ed., Quarterly Safety Summary*) is not, in practice, a particular factor in its effect. Liquid arsenic trichloride has a strongly corrosive effect on the skin.

Gassing—Nitrous Fumes.—Seven persons lost their lives as a result of poisoning by nitrous fumes in a printing works at Chatelaudren, near Saint-Brieuc. The intensely hot weather caused a bottle of nitric acid to explode, and the acid coming into contact with paper gave off heavy fumes. Firemen, who were called in, quickly mastered the trouble and after two hours

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Peroxides.—During a class demonstration of the preparation of oxygen by the action of water on sodium peroxide, an explosion shattered the apparatus. A reminder of the dangers of peroxides may be useful.

Lead Nitrate and Potassium Acetate.—A mixture of lead nitrate and potassium acetate were given to a student for qualitative analysis. On heating in a dry tube, a violent explosion occurred, causing minor injury in the form of cuts on the face and hands. On the experiment being repeated, potassium nitrate and lead acetate crystals were ground together and heated in a dry ignition tube, behind the glass door of a fume cupboard. The first time, after the evolution of a little steam, the reaction mixture swelled up (similar to the Pharaoh's serpent experiment) and was then violently ejected, with no damage to the tube. On a second attempt an explosion occurred and the tube was shattered. On a third, the bottom of the tube swelled into a bubble and burst. In the fourth, the contents of the tube became more or less incandescent (similar to the experiment of heating iron filings with sulphur) and small sparks were emitted.—*Contributed by F. R. H.*

A.R.P. NOTE

Fire Extinguishers and Incendiary Bombs.—The danger attending the use of carbon tetrachloride in attempting to extinguish bombs of the thermit or electron type appears to be twofold:—

(1) Explosive reaction:—$2Mg + CCl_4 = 2MgCl_2 + C$ (cf. Lenze & Metz, *Z.ges. Schiess-u. Sprengstoffw.*, 1932, **27**, 255, 293, 337, 373) and similar reactions with other halogenated hydrocarbons.

(2) The production of phosgene, $COCl_2$, and other toxic vapours. (See *A.R.P. Handbook No.* 9, p. 17).

It should be generally known that the use of extinguishers of this type is liable to lead to violent explosion and the production of large quantities of phosgene, particularly in the presence of metallic iron from the thermit.

The effect of using any of the halogen compounds on magnesium or thermit will not normally result in extinction, but will produce a somewhat violent interaction with the result that localised explosions occur, especially if the burning metal is in a finely divided form, when the disturbance caused by the impingement of the jet aggravates the action. At the high temperature at which magnesium and aluminium burn, rapid dissociation of the extinguishing media takes place, and compound gases of a high toxicity index are formed.

In the case of thermit, which is a kindred instance, the use of CCl_4 may result in the formation of considerable amounts of phosgene while dense pungent fumes will certainly result. Carbonyl bromide, the gas in the bromine series, is so unstable that the use of methyl bromide does not result in its formation to any considerable extent, but this medium, while being much more powerful on the majority of fires, is equally ineffective in practice on the burning metals.—*Contributed by D. J. G. I. and C.I.P., September,* 1939.

N.B.—It may be mentioned that a laboratory occurrence of peculiar interest at the present time notified by a member has been reported to a Government Department, at whose request publication is withheld.

Fellows and Associates are invited to send in particulars of any unusual laboratory occurrences within their experience.

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